



2604/973

מדינת ישראל  
STATE OF ISRAEL

Ministry of Justice  
Patent Office

משרד המשפטים  
לשכת הפטנטים

This is to certify that  
annexed hereto is a true  
copy of the documents as  
originally deposited with  
the patent application  
particulars of which are  
specified on the first page  
of the annex.

זאת לתעודה כי  
רוצפים בזה העתקים  
נכונים של המסמכים  
שהופקו לכתחילה  
עם הבקשה לפטנט  
לפי הפרטים הרשומים  
בעמוד הראשון של  
הנספח.

.....  
This 03-11-2004 חיום

לטרוי  
רשם  
הפטנט  
Commissioner of Patents



נחותר  
Certified

חוק הפטנטים, התשכ"ז-1967  
PATENTS LAW, 5725-1967  
**בקשה לפטנט**  
Application for Patent

לשימוש הלשכה  
For Office Use

מספר: 158683  
Number

תאריך: 30-10-2003  
Date

הוקדמת/נדחתה  
Ante/Post-Dated

אני (שם המבקש, מענו - ולגבי גוף מאוגד - מקום התאגדותו)  
(Name and address of applicant, and, in case of a body corporate, place of incorporation)

סביוון תעשיות (1987) בעמ, ת.ד. 4076, אשדוד 77140, ישראל

SAVION INDUSTRIES (1987) Ltd., P.O.Box 4076, Ashdod, 77140, Israel

שםהו:  
Owner, by virtue of the Law

בעל המצאה מכת הדין  
of an invention, the title of which is:

פלטפורמה ממונעת עם כושר תמרון  
(בעברית)  
(Hebrew)

POWER- DRIVEN MANEUVERABLE PLATFORM

(באנגלית)  
(English)

המציא/ים: צימבליסטה דב, רח' מלציט 32, תל אביב  
The Inventor/s: ZIMBALISTA, Dov, 32 Melchet St. Tel Aviv, Israel

Hereby apply for a patent to be granted to me in respect thereof  
מבקש בזאת כי ינתן לי עליה פטנט.

*בקשת חלוקה Application for Division	*בקשת פטנט מוסף- Application for Patent of Addition	דרישת דין קידמה Priority Claim			
מבקש פטנט from Application No. מס'	לבקשת/לפטנט to Patent/Appn. No. מס'	מספר/סימן Number/Mark	תאריך Date	מדינת האיגוד Convention Country	
Dated מיום	Dated מיום				
יפוי כת: עוד יוגש P.O.A.: Specific, will be filled on a later date Has been filed in case הוגש בעניין:					
מען למסירת הידועות Address for Service in Miller-Sieradzki ADV. & PAT. ATTR. P.O.Box 6145 HAIFA 31061 ISRAEL					
מען לשירות ישראל Miller-Sieradzki טל. 04-6145 ת.ז. 31061 שלט: 1671/0 Our Ref:					
תאריך המבקש Miller - שירצקי עורכי דין - זין ולורקי פטנטים					
This 29 שנות 2003 בחודש אוקטובר of October 2003					
לשימוש הלשכה For Office Use					

טופס זה, כשהוא מוטבע בחרותם לשכת הפטנטים ומושלים במספר ובתאריך חתימתה שטרוטיה רשותים. ג.ע.ל.  
This form, impressed with the Seal of the Patent Office and indicating the number and date of filing, certifies the filing of the Application, the  
particulars of which are set out above.

\*מחק את המיותר Delete whatever is inapplicable

**פלטפורמה ממנועת עם כושר תמרון**

**POWER- DRIVEN  
MANEUVERABLE PLATFORM**

## POWER-DRIVEN MANEUVERABLE PLATFORM

### FIELD OF THE INVENTION

[0001] The present invention relates to transportation platforms. More particularly it relates to an easily-maneuverable power-driven platform, mainly, but not solely, for use as a patient trolley, stretcher, hospital-bed and the like.

### BACKGROUND OF THE INVENTION

[0002] Transportation of patients or medical supplies and equipment in medical institutions is usually carried out on wheeled platforms, namely wheeled beds, patient trolleys or stretchers (for brevity purpose the general term "trolley" is used throughout the present specification).

[0003] Conventionally patient transport trolleys are used, in which the patient has to be pushed or pulled by attendants. The loads vary according to the type of equipment used, types of casters, patient weight and the types of surfaces and gradients over which patients have to be transported.

[0004] Although most hospital trolleys are provided with swivel casters, which can rotate and allow changing the direction of motion while on the move starting from a stationary position, it is not easy to maneuver the trolley around hospital corridors. One problem is the weight of the loaded platform, which makes it rather difficult to wheel the trolley and maneuver it around.

[0005] A fifth auxiliary wheel is sometimes used in trolleys for providing better support and for reduce the radius of turning for the trolley (see, for example, US 5,987,671 Heimbrock et al.), US 5,158,319 (Norcia et al.), US 6,256,812 (Bartow et al.)).

[0006] The present invention aims at providing an easily-maneuverable power-driven platform, which is designed to better maneuver making it easier for the attendant to wheel the trolley.

[0007] The present invention also aims at providing such easily-maneuverable power-driven platform which is more safely to use, and therefore facilitates savings in transportation costs, saving in wear and tear in equipment, buildings, and corridors, and most importantly preventing physical injuries and strains that may be inflicted on the patient-handling staff, nurses and other medical personnel involved in the transportation of patients and equipment in hospitals and similar institutions.

[0008] Currently there are some power-driven trolleys commercially available. One, which uses the auxiliary wheel principle, is steered by motor powered twin-wheels, that may be separately controlled in order to turn sideways. In order to perform such a maneuver, one of the twin-wheels is rotated faster than the second wheel, or even rotated in opposite direction to the second wheel, and thus turning is achieved. This is sometimes referred to as "differential steering".

#### SUMMARY OF THE INVENTION

[0009] There is thus provided, in accordance with a preferred embodiment of the present invention, a power-driven-maneuverable platform for wheeling a load on a ground, the apparatus comprising:

- [0010] a support surface for carrying a load;
  - [0011] a carrier base, on which the support surface is mounted, the carrier base provided with a plurality of swivel wheels for wheeling the apparatus in any desired direction, and an auxiliary wheel, capable of rotating about an axis in a fixed plane of rotation, the auxiliary wheel capable of being lowered to engage with the ground or being raised to disengage;
  - [0012] a power source;
  - [0013] a motor, powered by the power source, for driving the auxiliary wheel; and
  - [0014] a control unit for provision of power to the auxiliary wheel.
- [0015] Furthermore, in accordance with a preferred embodiment of the present invention, the auxiliary wheel is engaged or disengaged using a hydraulic or pneumatic shaft.
- [0016] Furthermore, in accordance with a preferred embodiment of the present invention, a pedal is provided for engagement and disengagement of the auxiliary wheel.
- [0017] Furthermore, in accordance with a preferred embodiment of the present invention, the control unit is a retractable control console.
- [0018] Furthermore, in accordance with a preferred embodiment of the present invention, the control console includes two handles, one of which is a single twist-grip actuator communicating with the motor to increase, reduce or cut off speed.
- [0019] Furthermore, in accordance with a preferred embodiment of the present invention, the control console is provided with a panel with indicators.

[0020] Furthermore, in accordance with a preferred embodiment of the present invention, the indicators are selected from the group consisting of the following indicators: left-hand grip power indicator, charging indicator, low battery indicator, overload indicator, forward-reverse switch and power indicator.

[0021] Furthermore, in accordance with a preferred embodiment of the present invention, the swivel wheels are each provided with a braking/fixing/central-locking pedal.

[0022] Furthermore, in accordance with a preferred embodiment of the present invention, wherein the support surface is mounted on the carrier base over height-adjustable columns.

[0023] Furthermore, in accordance with a preferred embodiment of the present invention, wherein the height of each of the adjustable columns may be separately adjusted using provided pedals in order to attain various titling positions.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0024] In order to better understand the present invention, and appreciate its practical applications, the following Figures are provided and referenced hereafter. It should be noted that the Figures are given as examples only and in no way limit the scope of the invention. Like components are denoted by like reference numerals.

[0025] Fig. 1a illustrates an elevated view of a power-driven maneuverable platform, in accordance with a preferred embodiment of the present invention, with a retractable control console in a retracted position.

[0026] Fig. 1b is a side view of the power-driven maneuverable platform of Fig. 1a.

[0027] Fig. 2 illustrates an elevated view of the power-driven maneuverable platform of Figs. 1a, 1b, in accordance with a preferred embodiment of the present invention, with a retractable control console in a deployed position.

[0028] Fig. 3 illustrates a detail from the suspension construction containing the power source for a motorized auxiliary wheel incorporated in a power-driven maneuverable platform, in accordance with a preferred embodiment of the present invention.

[0029] Fig. 4 illustrates an optional control panel for the retractable control console.

#### DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0030] The present invention introduces a power-driven easily-maneuverable platform, particularly for use as a hospital-bed, trolley or as a medical-supply carrier. Note, nevertheless, that the platform of the present invention may also be used for other purposes, and these other purposes are also covered by the scope of the present invention.

[0031] The platform of the present invention incorporates an auxiliary wheel, provided as an addition to a platform wheeled on a plurality of swivel wheels (also known as casters). This auxiliary wheel, contrary to the swivel wheels is fixed in its plane of rotation, which is parallel (or substantially parallel) to the longitudinal aspect of the trolley, and is powered by a motor, preferably an electric motor. The electric motor, through an optional transmission mechanism, powers the auxiliary wheel, and the speed of the wheel is preferably controlled by an attendant, using, in a preferred embodiment of the present invention, a control console.

[0032] The auxiliary wheel is an adjustable wheel, which maybe engaged to the floor or disengaged as desired, so that when it is disengaged the platform may be manually transported and maneuvered in any desired direction, whereas when the auxiliary wheel is engaged, it is motor-powered to drive the trolley in the direction of its rotation (i.e. parallel to the longitudinal aspect of the trolley). The driving of the trolley is quite simple with the aid of a control console, provided on the trolley, preferably with two handles, one of which is a single twist-grip actuator communicating with the motor to increase, reduce or cut off the speed. If the attendant desires to turn all he has to do is push one handle and pull the other, using the point at which the auxiliary wheel touches the ground as a pivot, while moving.

[0033] The present invention provides a motorized power driven platform, which reduces the load and effort required on the part of the patient attendant to almost zero. The trolley will proceed on its own power and the attendant has only to steer.

[0034] Fig. 1a illustrates an elevated view of a power-driven maneuverable platform, in accordance with a preferred embodiment of the present invention, with a retractable control console in a retracted position.

[0035] The platform, generally denoted by numeral 10, which is in this example a trolley, comprises a support surface 12 for carrying a patient (with an optional tiltable portion 14), mounted on a transportable carrier base 20. The support surface 12 is also provided with safety rails 16 for securing the patient on the trolley and preventing him from rolling over and falling off. The carrier base is provided with four swivel wheels 22, allowing the carrier base to be wheeled in any desired direction. Note that the number of swivel wheels may vary, although four seems to be an optimal number for the swivel wheels. The swivel wheels are each provided with an optional

braking/fixing/central locking pedal 24. A retractable control console 30, shown in a retracted position below support surface 12, is provided for controlling the transportation of the trolley, as is hereinafter explained.

[0036] Fig. 1b is a side view of the power-driven maneuverable platform of Fig. 1a. Support surface 12 is carried by two adjustable columns 32, the height of which is determined by operating pedal 26. Furthermore, the height of each of the adjustable columns may be separately adjusted using provided pedals in order to attain various titling positions (such as trendelenburg, or reverse trendelenburg). The adjusting of the height of the columns can be made using a hydraulic, pneumatic, electrical or mechanical means. Alternatively, the platform can be fixed above the carrier base.

[0037] An auxiliary wheel 28 is provided, attached to carrier base 20, and capable of being moved between two positions, one position being when the wheel is suspended over the ground (hereinafter – disengaged position), and the second position being when the wheel is lowered to have contact with the ground (hereinafter – engaged position) – see further explanation with reference to Fig. 4.

[0038] Fig. 2 illustrates an elevated view of the power-driven maneuverable platform of Figs. 1a, 1b, in accordance with a preferred embodiment of the present invention, with a retractable control console in a deployed position. Here the control console 30 is extended upwards, facilitating operation by an attendant. The control console 30 is provided with handgrips (36a, 36b) one of which is a twist grip throttle for controlling the speed of the trolley when driven.

[0039] Fig. 3 illustrates a suspension construction 29 containing the power source 40 (electric battery) for a motorized auxiliary wheel 28 incorporated in a power-driven

maneuverable platform, in accordance with a preferred embodiment of the present invention. The battery 40 powers motor 43, which via transmission 44 drives auxiliary wheel 28. The auxiliary wheel is shown here in a disengaged position, over the ground. A pneumatic or hydraulic shaft 42 is used to lower or raise the auxiliary wheel, the position of which preferably governed by pedal 25.

[0040] Fig. 4 illustrates an optional control panel for the retractable control console 50. Optional control indicators include left-hand grip power indicator 52 (which is a indication on the actuation of a mechanism designed to ensure that the person transporting the trolley is holding both handles), charging indicator 54, low battery indicator 56, overload indicator 58, forward-reverse switch 60 and power indicator 60. A logo 64 may also appear on the control panel.

[0041] The present invention permits attendants to transport patients or equipment over long distances, over almost any kind of surfaces (like uneven surfaces, and up or down gradients in the surface). The effort required is minimal, falls well within all current standard for loads to be carried by attendants and thus prevents injuries and stress to the patient attendant. The present invention also reduces operating costs by reducing the number of personnel required to transport patients or equipment, and reduces inadvertent damage that might occur to other equipment and buildings (such as walls, corridors, door-frames) through more accurate steering control.

[0042] It should be clear that the description of the embodiments and attached Figures set forth in this specification serves only for a better understanding of the invention, without limiting its scope as covered by the following Claims.

[0043] It should also be clear that a person skilled in the art, after reading the present specification could make adjustments or amendments to the attached Figures and above described embodiments that would still be covered by the following Claims.

## CLAIMS

1. A power-driven maneuverable platform for wheeling a load on a ground, the apparatus comprising:
  - a support surface for carrying a load;
  - a carrier base, on which the support surface is mounted, the carrier base provided with a plurality of swivel wheels for wheeling the apparatus in any desired direction, and an auxiliary wheel, capable of rotating about an axis in a fixed plane of rotation, the auxiliary wheel capable of being lowered to engage with the ground or being raised to disengage;
  - a power source;
  - a motor, powered by the power source, for driving the auxiliary wheel; and
  - a control unit for provision of power to the auxiliary wheel.
2. The apparatus of claim 1, wherein the auxiliary wheel is engaged or disengaged using a hydraulic or pneumatic shaft.
3. The apparatus of claim 1, wherein a pedal is provided for engagement and disengagement of the auxiliary wheel.
4. The apparatus of claim 1, wherein the control unit is a retractable control console.
5. The apparatus of claim 4, wherein the control console includes two handles, one of which is a single twist-grip actuator communicating with the motor to increase, reduce or cut off speed.

6. The apparatus of claim 4, wherein the control console is provided with a panel with indicators.

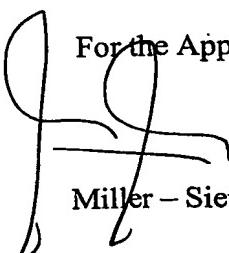
7. The apparatus of claim 6, wherein the indicators are selected from the group consisting of the following indicators: left-hand grip power indicator, charging indicator, low battery indicator, overload indicator, forward-reverse switch and power indicator.

8. The apparatus as claimed in claim 1, wherein the swivel wheels are each provided with a braking/fixing/central-locking pedal.

9. The apparatus as claimed in claim 1, wherein the support surface is mounted on the carrier base over height-adjustable columns.

10. The apparatus as claimed in Claim 9, wherein the height of each of the adjustable columns may be separately adjusted using provided pedals in order to attain various titling positions.

11. A power-driven maneuverable platform substantially as described in the present specification, accompanying drawings, and appending claims.



For the Applicant  
Miller - Sieradzki  
Advocates & patent attorneys

Fig. 1a

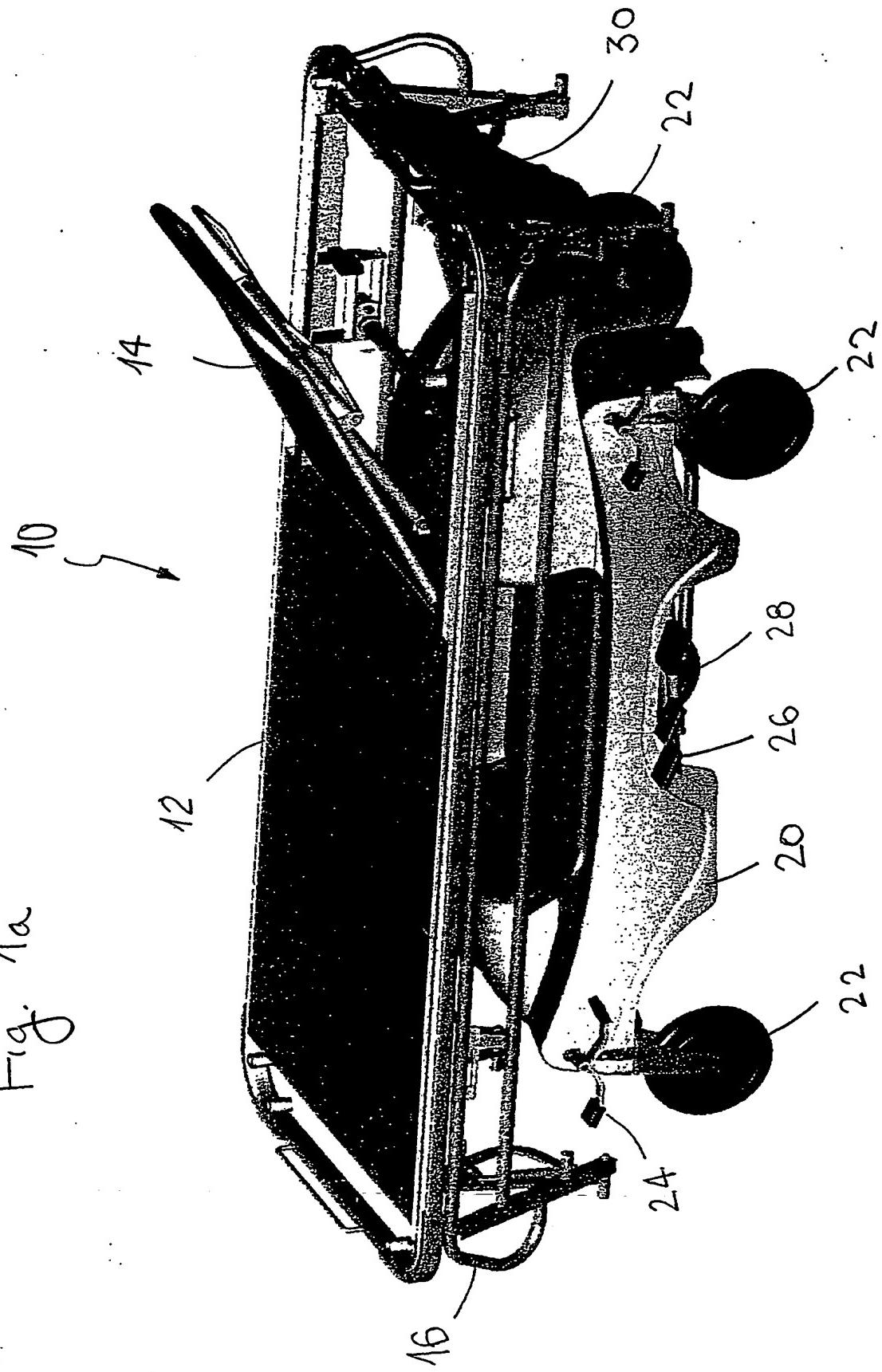
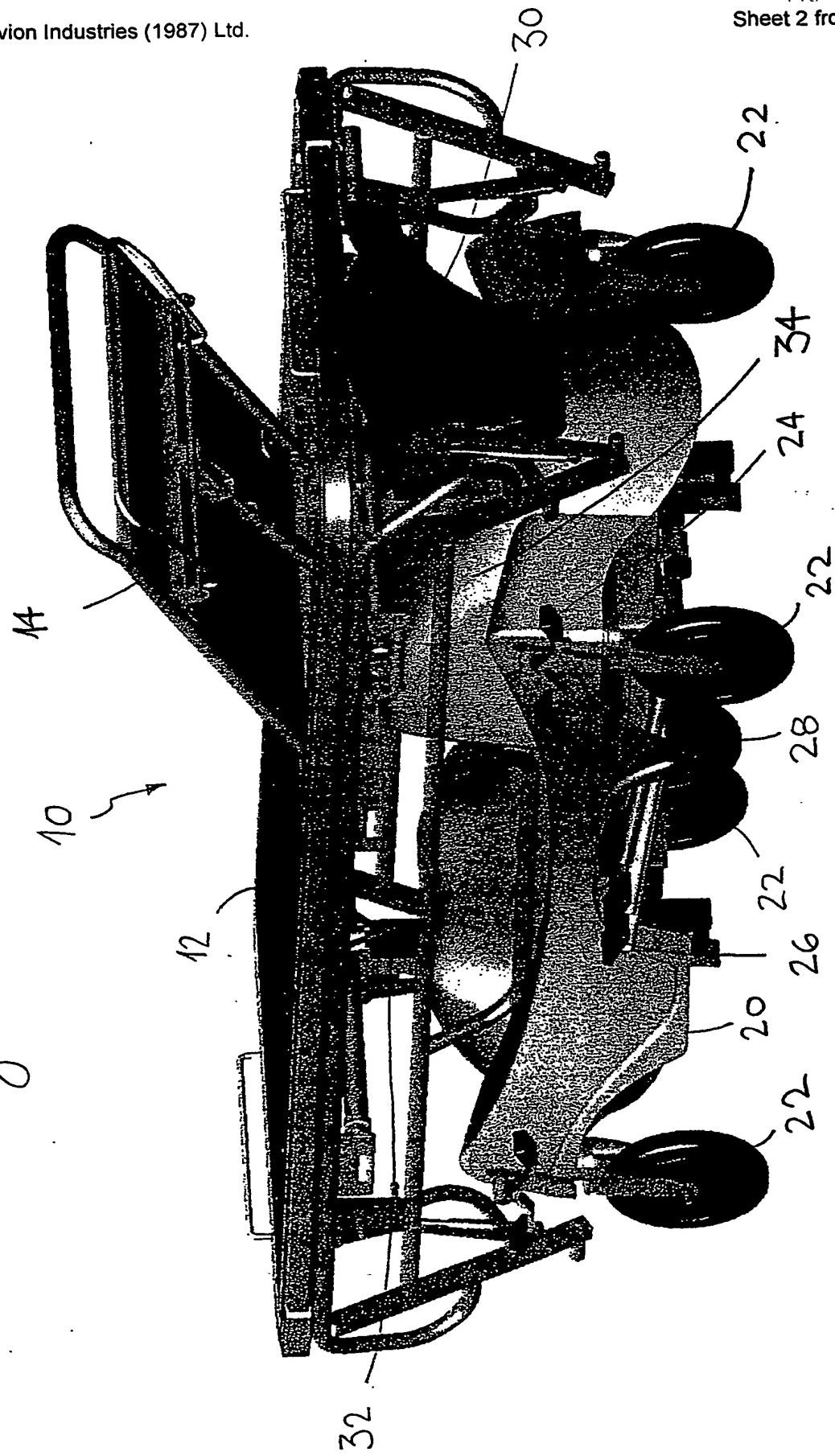


Fig. 1b



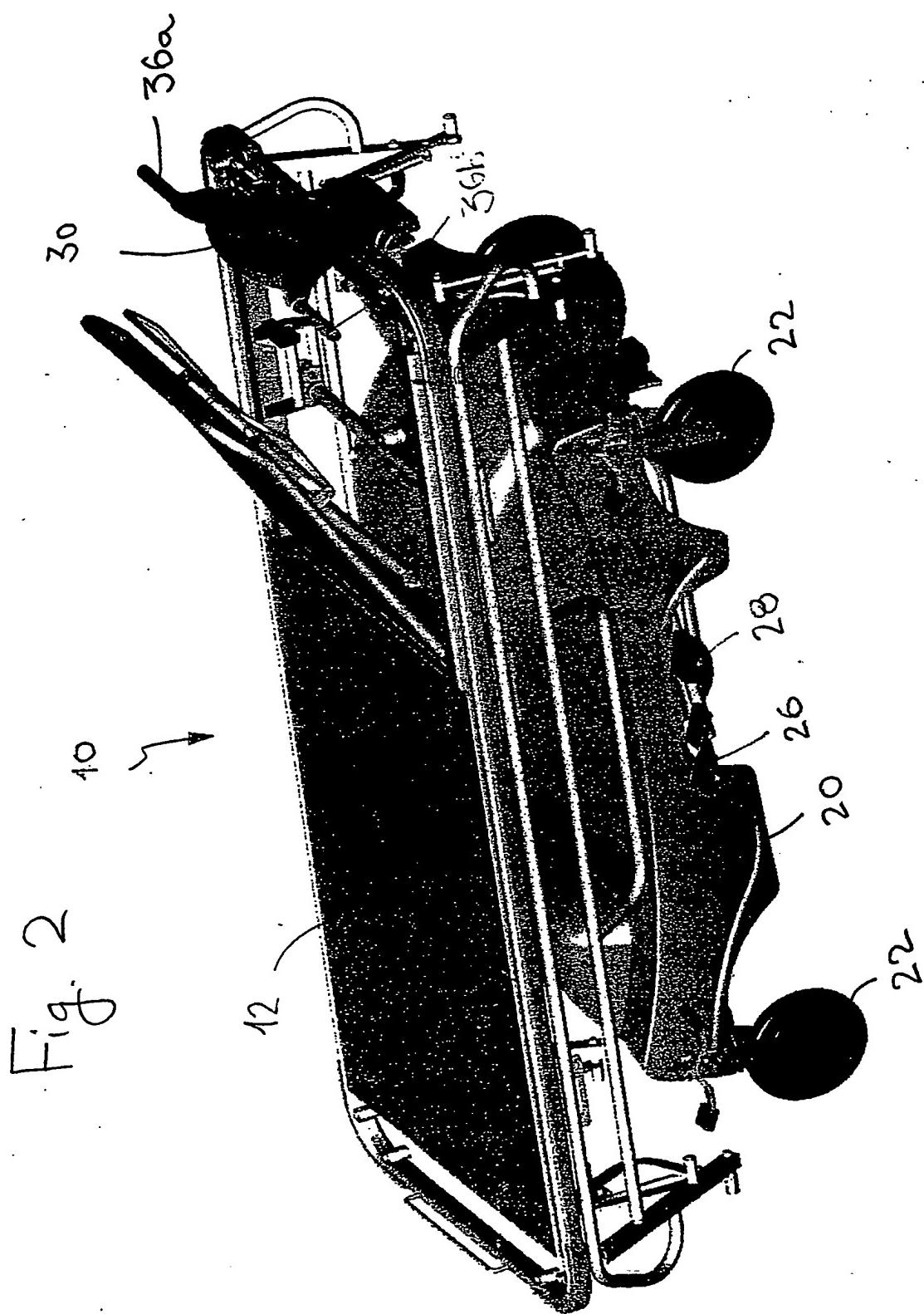


Fig. 5

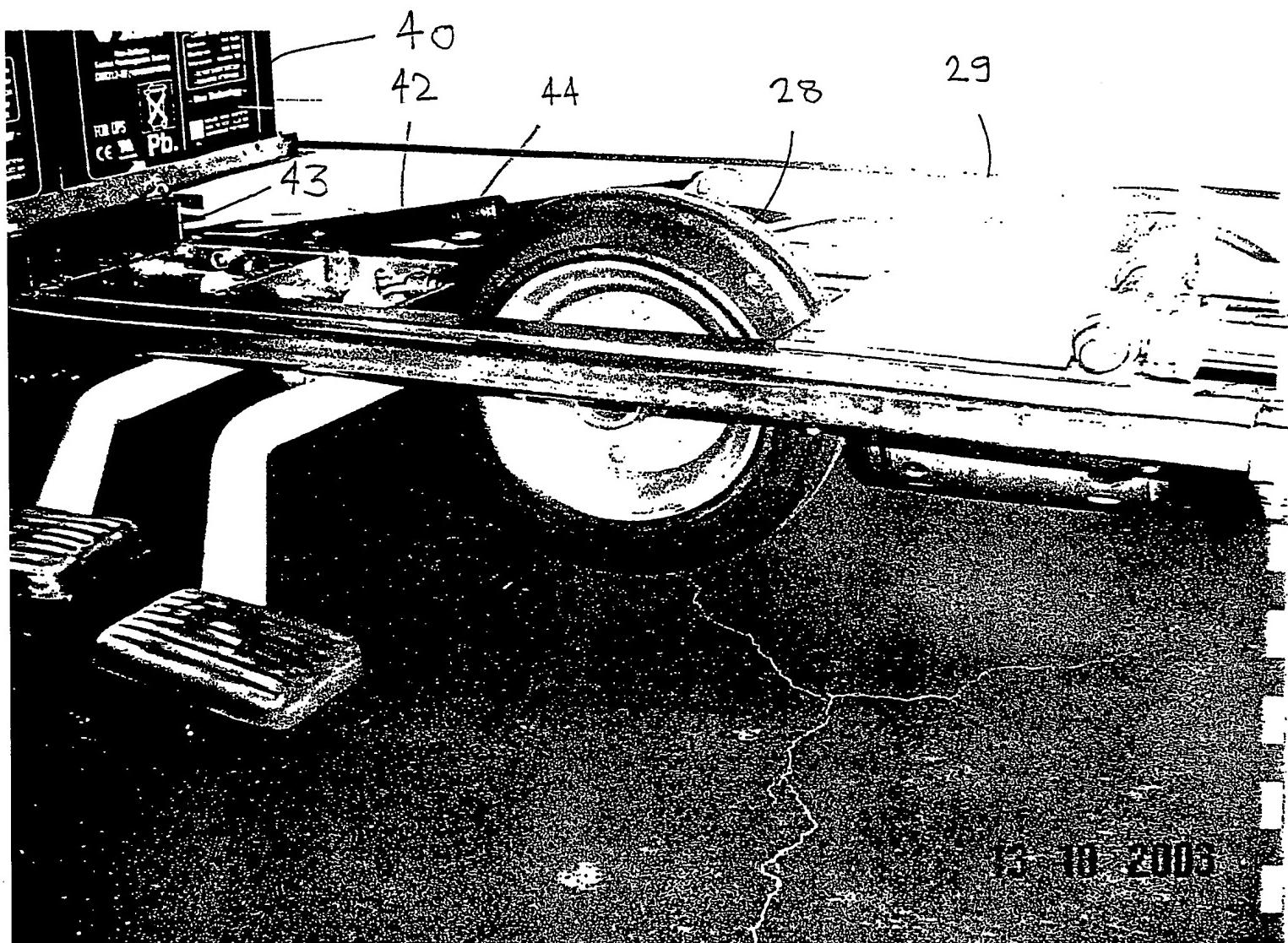
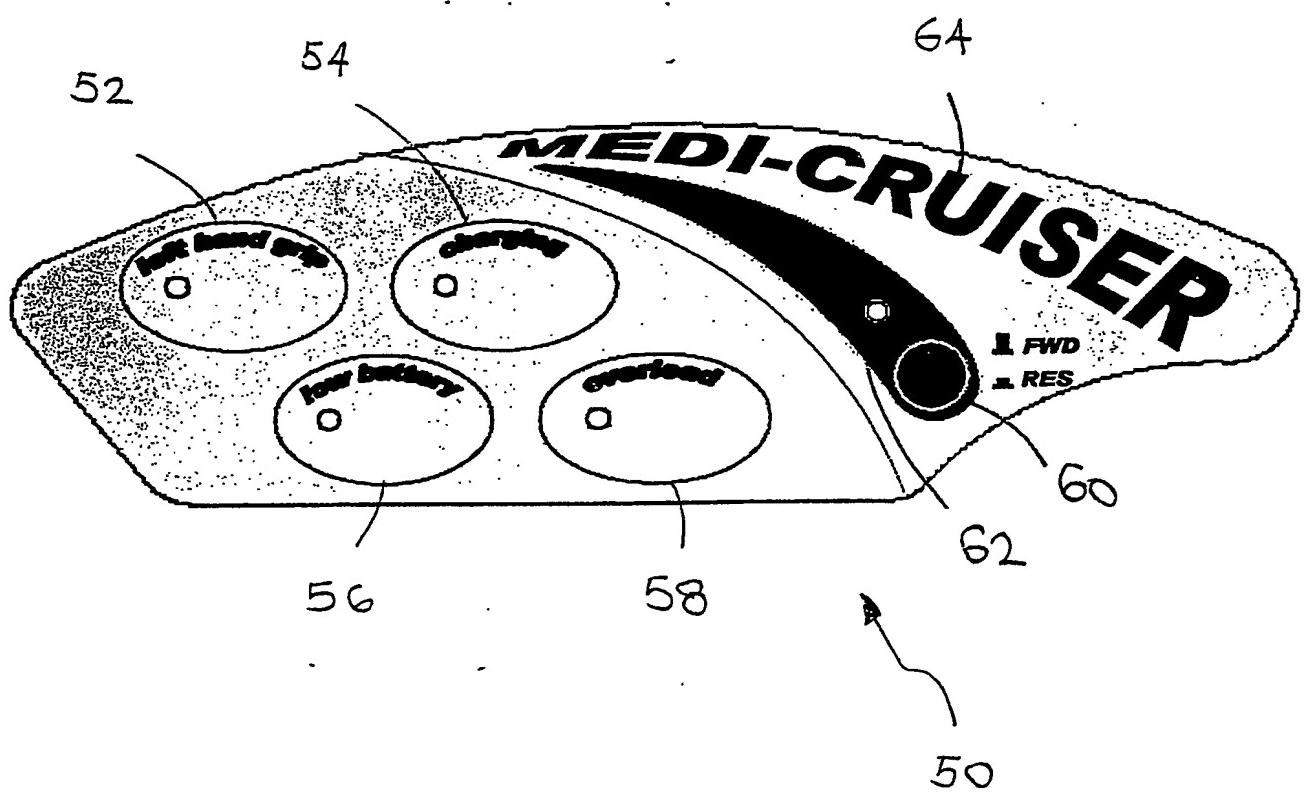


Fig. 4



# **Document made available under the Patent Cooperation Treaty (PCT)**

International application number: PCT/IL04/000973

International filing date: 26 October 2004 (26.10.2004)

Document type: Certified copy of priority document

Document details: Country/Office: IL  
Number: 158683  
Filing date: 30 October 2003 (30.10.2003)

Date of receipt at the International Bureau: 07 December 2004 (07.12.2004)

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b)



World Intellectual Property Organization (WIPO) - Geneva, Switzerland  
Organisation Mondiale de la Propriété Intellectuelle (OMPI) - Genève, Suisse